

WHAT IS CLAIMED IS:

1                   1. A recording/reproducing separated type magnetic head comprising:  
2                   a reproducing head having a reproducing element, said reproducing element  
3 being disposed by way of an insulating layer formed between a lower magnetic shield  
4 disposed on a substrate and an upper magnetic shield; and  
5                   a recording head including a lower magnetic pole disposed adjacent to said  
6 reproducing head and formed with a protrusion at one end of the lower magnetic pole, an  
7 upper magnetic pole disposed by way of a magnetic gap layer over the lower magnetic pole,  
8 said upper magnetic pole providing a magnetic gap at one end portion including the  
9 protrusion, said upper magnetic pole being connected with the lower magnetic pole on the  
10 side opposite to the magnetic gap, and conductor coils disposed by way of another insulating  
11 layer formed between the upper magnetic pole and the lower magnetic pole.

1                   2. A recording/reproducing separated type magnetic head according to claim  
2 1, wherein a second protrusion is formed on one end portion including the protrusion formed  
3 on the lower magnetic pole or the lower magnetic pole front end layer but at a portion  
4 opposing to the upper magnetic pole.

1                   3. A recording/reproducing separated type magnetic head according to claim  
2 1, wherein said upper magnetic pole has an upper magnetic pole front end layer located at a  
3 portion providing the magnetic gap, an upper magnetic pole upper layer in contiguous with  
4 the upper magnetic layer front end layer, and an upper magnetic pole rear end layer in  
5 contiguous with the upper magnetic pole upper layer and connected to the lower magnetic  
6 pole rear end layer.

1                   4. A recording/reproducing separated type magnetic head according to claim  
2 1, wherein the conductor coils are stacked by two or more layers and each of the conductor  
3 coils are connected in series at the end.

1                   5. A recording/reproducing separated type magnetic head according to claim  
2 1, wherein the conductor coils are constituted with two layers and the lower layer conductor

3 coils are disposed between the upper magnetic pole front end layer and the upper magnetic  
4 pole rear end layer.

1 6. A recording/reproducing separated type magnetic head according to claim  
2 1, wherein the conductor coils are constituted with two layers, the lower layer conductor coils  
3 are disposed between the lower magnetic pole front end layer and the lower magnetic pole  
4 rear end layer, and the upper layer conductor coils are disposed between the upper magnetic  
5 pole front end layer and the upper magnetic layer rear end layer.

1 7. A recording/reproducing separated type magnetic head comprising:  
2 a reproducing head having a reproducing element, said reproducing element  
3 being disposed by way of an insulating layer formed between a lower magnetic shield  
4 disposed on a substrate and an upper magnetic shield; and  
5 a recording head including a lower magnetic pole disposed adjacent to said  
6 reproducing head and formed with a protrusion at one end of the lower magnetic pole with  
7 opposite corners in an upper portion of said protrusion being removed, an upper magnetic  
8 pole disposed by way of a magnetic gap layer over the lower magnetic pole, said upper  
9 magnetic pole providing a magnetic gap at one end portion including the protrusion, said  
10 upper magnetic pole being connected with the lower magnetic pole on the side opposite to the  
11 magnetic gap, and conductor coils disposed by way of another insulating layer formed  
12 between the upper magnetic pole and the lower magnetic pole.

1 8. A recording/reproducing separated type magnetic head according to claim  
2 7, wherein a second protrusion is formed on one end portion including the protrusion formed  
3 on the lower magnetic pole or the lower magnetic pole front end layer but at a portion  
4 opposing to the upper magnetic pole.

1 9. A recording/reproducing separated type magnetic head according to claim  
2 7, wherein said upper magnetic pole has an upper magnetic pole front end layer located at a  
3 portion providing the magnetic gap, an upper magnetic pole upper layer in contiguous with  
4 the upper magnetic layer front end layer, and an upper magnetic pole rear end layer in  
5 contiguous with the upper magnetic pole upper layer and connected to the lower magnetic  
6 pole rear end layer.

1                   10. A recording/reproducing separated type magnetic head according to claim  
2 7, wherein the conductor coils are stacked by two or more layers and each of the conductor  
3 coils are connected in series at the end.

1                   11. A recording/reproducing separated type magnetic head according to claim  
2 7, wherein the conductor coils are constituted with two layers and the lower layer conductor  
3 coils are disposed between the upper magnetic pole front end layer and the upper magnetic  
4 pole rear end layer.

1                   12. A recording/reproducing separated type magnetic head according to claim  
2 7, wherein the conductor coils are constituted with two layers, the lower layer conductor coils  
3 are disposed between the lower magnetic pole front end layer and the lower magnetic pole  
4 rear end layer, and the upper layer conductor coils are disposed between the upper magnetic  
5 pole front end layer and the upper magnetic layer rear end layer.

1                   13. A recording/reproducing separated type magnetic head comprising:  
2                   a reproducing head having a reproducing element, said reproducing element  
3 being disposed by way of an insulating layer formed between a lower magnetic shield  
4 disposed on a substrate and an upper magnetic shield; and  
5                   a recording head including a lower magnetic pole disposed adjacent to said  
6 reproducing head, a lower magnetic pole front end layer disposed on one end of the lower  
7 magnetic pole and formed with a protrusion on one end of the lower magnetic pole front end  
8 layer, a lower magnetic pole rear end layer disposed on the other end of the lower magnetic  
9 pole, a non-magnetic insulating layer that fills a portion between the lower magnetic pole rear  
10 end layer and the lower magnetic pole front end layer, an upper magnetic pole disposed by  
11 way of a magnetic gap layer above the lower magnetic pole front end layer, the non-magnetic  
12 insulating layer and the lower magnetic pole rear end layer, said upper magnetic pole  
13 providing a magnetic gap at one end portion including the protrusion, said upper magnetic  
14 pole being connected with the lower magnetic pole rear end layer, and conductor coils  
15 disposed by way of another insulating layer formed between the upper magnetic pole and the  
16 lower magnetic pole.

1                   14. A recording/reproducing separated type magnetic head according to claim  
2 13, wherein a second protrusion is formed on one end portion including the protrusion formed  
3 on the lower magnetic pole or the lower magnetic pole front end layer but at a portion  
4 opposing to the upper magnetic pole.

1                   15. A recording/reproducing separated type magnetic head according to claim  
2 13, wherein said upper magnetic pole has an upper magnetic pole front end layer located at a  
3 portion providing the magnetic gap, an upper magnetic pole upper layer in contiguous with  
4 the upper magnetic layer front end layer, and an upper magnetic pole rear end layer in  
5 contiguous with the upper magnetic pole upper layer and connected to the lower magnetic  
6 pole rear end layer.

1                   16. A recording/reproducing separated type magnetic head according to claim  
2 13, wherein the conductor coils are stacked by two or more layers and each of the conductor  
3 coils are connected in series at the end.

1                   17. A recording/reproducing separated type magnetic head according to claim  
2 1, wherein the conductor coils are constituted with two layers and the lower layer conductor  
3 coils are disposed between the upper magnetic pole front end layer and the upper magnetic  
4 pole rear end layer.

1                   18. A recording/reproducing separated type magnetic head according to claim  
2 13, wherein the conductor coils are constituted with two layers, the lower layer conductor  
3 coils are disposed between the lower magnetic pole front end layer and the lower magnetic  
4 pole rear end layer, and the upper layer conductor coils are disposed between the upper  
5 magnetic pole front end layer and the upper magnetic layer rear end layer.